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ASSIGNMENT BOOKLET

SCN2231 Biology 20

Module 2 Assignment

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Biology 20

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Module 2

BIOSPHERE EQUILIBRIUM AND THE IMPACT OF HUMANS

ASSIGNMENT BOOKLET

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 1 Assignment	18	
Lesson 2 Assignment	34	
Lesson 3 Assignment	49	

Teacher's Comments

Biology 20

Module 2: Biosphere Equilibrium and the Impact of Humans

Assignment Booklet

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This document is intended for

Students ☒

Teachers ☒

Administrators ☐

Home Instructors ☐

General Public ☐

Other ☐



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- Alberta Education, <http://www.education.gov.ab.ca>
- Learning Resources Centre, <http://www.lrc.education.gov.ab.ca>
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MODULE 2: LESSON 1 ASSIGNMENT

This Module 2: Lesson 2 Assignment is worth 18 marks. The value of each assignment and each question is stated in the left margin.

(18 marks) **Lesson 1 Assignment: Ecosystem Productivity: A Balance Between Energy and Matter**

Lab 1: Thought Lab 2.3: Too Much of a Good Thing

Complete “Thought Lab 2.3: Too Much of a Good Thing” from page 54 of your textbook. You may complete the four Analysis questions collaboratively with one or more students, or answer the questions on your own. You can use the discussion area for your group to work out your collective responses. If you have completed the assignment with other students, please list all of your names on this assignment for your instructor.

Some things to consider as you work through this lab include the following:

- UVR travels in wavelengths and is a form of electromagnetic energy (like light).
- UVR can disrupt or cause mutations in DNA, which is associated with different cancers.

(4 marks) **Analysis Question 1:**

(4 marks) **Analysis Question 2:**

(4 marks) **Analysis Question 3:**

(6 marks) **Analysis Question 4:**

MODULE 2: LESSON 2 ASSIGNMENT

This Module 2: Lesson 2 Assignment is worth 34 marks. The value of each assignment and each question is stated in the left margin.

(34 marks) **Lesson 2 Assignment: Gas Exchange Equilibrium**

(15 marks) **TR 1. The Changing Atmosphere and Global Warming**

The atmosphere is currently composed of 21% oxygen and 0.03% carbon dioxide. Photosynthesis, cellular respiration, and other processes such as fossil fuel combustion combine to create the composition of the atmosphere. Answer the following questions.

- (4 marks) 1. How do the levels stay balanced as a constant percentage? Explain in terms of gas exchange in photosynthesis and cellular respiration.
- (8 marks) 2. List four factors that could affect the current oxygen and carbon dioxide levels, and then predict possible effects if the levels changed. Be sure to provide clear and reasonable answers.
- (3 marks) 3. The percentage for carbon dioxide, 0.03%, seems like such a small number. How can changes in this percentage be a factor in climate change?

(19 marks) Lesson 2 Lab: Biosphere in a Bottle

This assignment is based on “Investigation 2.D: Biosphere in a Bottle” on page 57 of your textbook. You will choose to complete the lab as outlined in the textbook or by using the chart provided in the lesson.

Lab Problem:

How can you design a model ecosystem that can survive as a self-regulating system?

Observations:

Place your observations here. They may be from your own observations or the observations provided for you in the lesson.

Analysis

Note: If you did not perform this lab, it is still possible to answer the following questions based on your prior knowledge and the data table that was provided for you.

For questions 1 to 7, read each question carefully. Provide complete answers. Place your answer in the blank space given.

- (3 marks) 1. Identify the producers, consumers, and decomposers in your model biosphere.
- (2 marks) 2. Which biogeochemical cycles were represented in your model biosphere?
- (1 mark) 3. Why did you use a clear bottle, rather than an opaque bottle, for your model biosphere?
- (1 mark) 4. How did the temperature in the model biosphere change over the trial period?
- (1 mark) 5. How did you recognize the cycling of water in your model biosphere?
- (4 marks) 6. How well did your model biosphere function as a self-regulating system? Explain.

(3 marks) 7. Answer either 7(a) OR 7(b).

(a) If you performed this lab by following the textbook, compare your model biosphere with another group's model biosphere. Are there any differences? If so, what may have caused these differences?

OR

(b) If you used data from the chart, describe the relationship between the temperature change and the number of organisms.

Conclusions:

Answer the following two questions.

(2 marks) 8. Predict the effect of decreasing the amount of light available to the model biosphere.

9. Predict the effect of a significant reduction in productivity in Earth's biosphere on levels of the following:

(1 mark) a. atmospheric oxygen

(1 mark) b. atmospheric carbon dioxide

MODULE 2: LESSON 3 ASSIGNMENT

This Module 2: Lesson 3 Assignment is worth 49 marks. The value of each assignment and each question is stated in the left margin.

(49 marks) Lesson 3 Assignment: The Ecological Footprint of Humans

(25 marks) TR 1. Ecological Footprints

Please complete these questions. If you are having difficulty finding information, try searching the UNESCO site using the keywords “ecological footprint nations.”

- (3 marks)** 1. a. Investigate the ecological footprint of your country in relation to two other countries. One country will have a similar footprint and the other one has a contrasting footprint. What is the population? What is the available capacity of each country? What is the ecological deficit? Present your findings in a chart format.
- (3 marks)** b. Write a conclusion that explains the ecological deficits.

- (4 marks) 2. a. Contrast the ecological deficit of the countries that have the largest and smallest ecological footprints. What pattern do you find? How can this be explained?
- (2 marks) b. How many planets would be needed if everyone in the world had your ecological footprint? Use your information from Get Focused. Explain why this answer surprises or does not surprise you.
- (4 marks) 3. What aspects of your lifestyle contributed the most to your footprint size? How does your ecological footprint compare to the average Canadian? What conclusions can you make?
- (9 marks) 4. How do your lifestyle choices affect the flow of energy and the cycling of matter in the biosphere? Explain by using three lifestyle choices.

(24 marks) Reflect and Connect

Reflect on the results of the ecological footprint quiz you took at the start of the lesson. Based on the results of the quiz and using what you have learned in this lesson, respond to the following questions.

- (8 marks)**
1. How could you make your ecological footprint smaller? Make a list of four choices you could make that would lessen your impact on the balance of the biosphere. Explain how each choice in your list would affect the cycles around you. You may want to do a quick web search to help you identify how your choice would have less impact on the balance of the biosphere.

- (16 marks)** 2. Technology is generally developed to meet your needs and to make you better at completing tasks. Discuss how technology affects your ecological footprint positively and negatively. A rubric is provided to show you how you will be marked.

4	3	2	1
• At least three technologies are discussed for positive effects. • At least three technologies are discussed for negative effects. • Interpretations and explanations of the impact of the technologies are logical and communicated effectively. • Interpretations and explanations make accurate references to the flow of energy, the cycling of matter, and biosphere equilibrium.	• Two technologies are discussed for positive effects. • Two technologies are discussed for negative effects. • Interpretations and explanations of the impact of the technologies are logical and mostly clear. • Interpretations and explanations make somewhat accurate references to the flow of energy, the cycling of matter, and biosphere equilibrium.	• One technology is discussed for positive effects. • One technology is discussed for negative effects. • Interpretations and explanations of the impact of the technology are logical and mostly clear. • Interpretations and explanations make somewhat accurate references to the flow of energy, the cycling of matter, and biosphere equilibrium.	• One technology is listed for positive effects. • One technology is listed for negative effects. • Interpretations and explanations of the impact of the technology are unclear. • Interpretations and explanations do not make accurate references to the flow of energy, the cycling of matter, and biosphere equilibrium.

Once you have completed all of the questions, submit your work to your teacher.

